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White pine blister rust infection hazard zones

by ANDRÉ LAVALLÉE



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LFC 23E • 1986

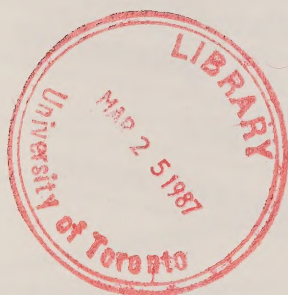
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White pine blister rust infection hazard zones

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CAI
RP 20
2011 (20)



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Within the intensive reforestation program already in progress throughout Quebec, making the best use of acquired knowledge is essential to improve the success of the operation. To date, white pine has been rarely preferred as a plantation species despite its high commercial value. Two major enemies, white pine blister rust and white pine weevil, were mostly responsible for disfavor towards this noble species which was highly renowned at the beginning of the century. In Information Leaflets LFC 6 and 18, the reader will find a detailed description of the life cycle, visible damage, and control measures for these two pests. With more intensive forest management programs, reducing damage to an acceptable level is more and more feasible if a low-risk plantation site can be selected.

Low hazard zones

Research over the last thirty years on the biology of the causal agent of blister rust (*Cronartium ribicola* J.C. Fisch.) allows us to identify disease hazard zones for white pine. This concept was first tested in Wisconsin, Northeastern United States, Quebec, and recently in Ontario.

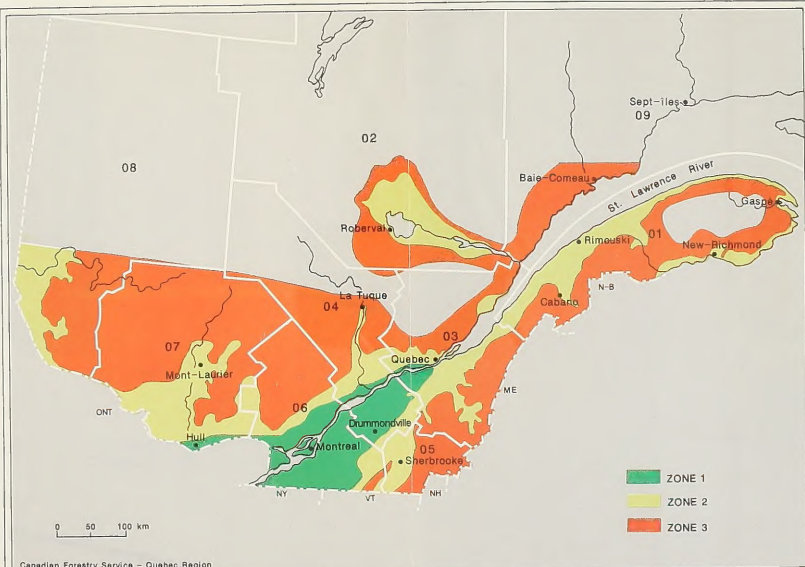
For Quebec, details of the approach validating low hazard zones were published in The Forestry Chronicle vol. 62, February 1986. General characteristics of these zones are:

- Zone 1.** Altitude less than 135 m, July-August average temperature of 20°C or higher. Rust infection level is about 5% of stems at any given time of stand life.
- Zone 2.** Altitude of 300 m or less, July-August average temperatures lower than 20°C. Infection level at any given time is less than 15% of the stems.

Finally, the botanical range of white pine leads to a third zone in which stems fatally infected could easily represent more than 15% of the stand since environment conditions favor new infections each year.

The choice of a plantation site within hazard zones

A survey of 40 000 trees in 380 different sample areas revealed the expected levels of infection in 86% of the stations. However, very low as well as very high levels of infection can be observed in the three hazard zones due to more or less favorable microclimatic conditions. To increase chances of plantation success within the zones, some sites should be preferred and others avoided.



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Figure 1. White pine blister rust infection hazard zones in Quebec.

Select

- Upper part of slopes, preferably those facing south.
- Well-aerated flat sites where wind currents will favor rapid dew evaporation.
- An overstorey providing 50% light for the plantation.
- Absence of *Ribes* (gooseberries and currants) in and around the site.

Avoid

Any topographical or site conditions that enhance lasting dew formation during cool windless nights such as:

- Kettle holes or depressions.
- Bottom of slopes, particularly those facing north.
- Small valleys surrounded with mature forest stands or small openings in a forest.
- Sites with dense ground vegetation and *Ribes* bushes.

On sites selected for white pine plantation, a survey and hygienic pruning of infected branches within the first five years will help reduce trunk cankers and indicate the need and frequency of further treatments. Also, a plantation under forest canopy, on a site away from pines or Norway spruce hosting the white pine weevil, will help delay treatments against this insect pest.

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Copies are available free of charge from:
Laurentian Forestry Centre
Canadian Forestry Service
1055 du P.E.P.S.
Sainte-Foy, Québec G1V 4C7

Catalogue No. Fo29-4/23-1986E
ISSN 0703-220X
ISBN 0-662-14742-1

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Cette publication est aussi disponible en français sous le titre :
« Les risques d'infection par la rouille vésiculeuse du pin blanc ».

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